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Christopher M. (Chris) Crane
Vice President, Browns Ferry Nuclear Plant

May 4, 1998

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

10 CFR 50.73

Dear Sir:

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 3 - DOCKET NO. 50-296
- FACILITY OPERATING LICENSE DPR-68 - LICENSEE EVENT REPORT
(LER) 50-296/1998003**

The enclosed report provides details concerning a manual reactor scram from approximately 57 percent power. This event resulted from a recirculation pump runback which caused the unit to enter the region of potential thermal-hydraulic instability on the power to flow map. The reactor was manually scrammed, as required by Technical Specifications. The recirculation pump runback was caused by a corporate engineer inadvertently grounding circuitry while performing a constructibility survey. This report is submitted in accordance with 10 CFR 50.73 (a)(2)(i)(A) as the completion of a shutdown required by Technical Specifications, and 10 CFR 50.73 (a)(2)(iv) as an event that resulted in an automatic actuation of an engineered safety feature, including the reactor protection system.

Sincerely,



C. M. Crane

Enclosure

cc: See page 2

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Enclosure

cc (Enclosure):

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS
LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK
TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO
THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S.
NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND
TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF
MANAGEMENT AND BUDGET, WASHINGTON, DC 20603.

FACILITY NAME (1)

Browns Ferry Unit 3

DOCKET NUMBER (2)

050000296

PAGE (3)

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TITLE (4)

Reactor Manually Scrammed to Prevent Thermal-Hydraulic Instability After Recirculation Pump Runback

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	07	1998	1998	003	00	05	04	98	NA	
									NA	
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		100	20.2201(b)		20.2203(a)(2)(v)		X		50.73(a)(2)(i)	50.73(a)(2)(viii)
			20.2203(a)(1)		20.2203(a)(3)(i)				50.73(a)(2)(ii)	50.73(a)(2)(x)
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)				50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(ii)		20.2203(a)(4)		X		50.73(a)(2)(iv)	OTHER
			20.2203(a)(2)(iii)		50.36(c)(1)				50.73(a)(2)(v)	Specify in Abstract below
			20.2203(a)(2)(iv)		50.36(c)(2)				50.73(a)(2)(vii)	or in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME

Mark DeRoche, Industry Affairs Supervisor

TELEPHONE NUMBER (Include Area Code)

(256) 729-7559

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE).	X				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On April 7, 1998, while performing a constructibility survey for DCN W40629A, Recirculation System Upgrade, a corporate engineer inadvertently shorted a recirculation pump control circuit, causing breaker 603 to trip. The resultant loss of power to critical circuits caused both recirculation pumps to runback to minimum speed. The associated reduction in core flow caused the unit to enter Potential Instability Region I on the power to flow map, which necessitated that the reactor be manually scrammed, as required by Technical Specifications.

Corrective actions will consist of strengthening the controls associated with walkdowns in NEDP-11, "Design Input Walkdown Controls," and briefing appropriate personnel on the additional requirements. In addition, appropriate personnel corrective actions were taken.

TVA is reporting this event in accordance with 10 CFR 50.73 (a) (2) (i), as the completion of any nuclear plant shutdown required by the plant's technical specifications and 10 CFR 50.73 (a)(2)(iv) an event that resulted in a manual or automatic actuation of an engineered safety feature, including the reactor protection system.

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Browns Ferry Unit 3	05000296	98	003	00	2 OF 5

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

I. PLANT CONDITION(S)

At the time of the event, Unit 3 was operating at 100 percent power. Unit 2 was operating at 100 percent power and Unit 1 was shutdown and defueled. Units 1 and 2 were not affected by this event.

II. DESCRIPTION OF EVENT

A. Event:

On April 7, 1998, while performing a constructibility survey for DCN W40629A, Recirculation System Upgrade, a corporate engineer inadvertently grounded a recirculation pump control circuit, causing breaker 603 to trip. The engineer was using a metallic measuring tape to measure clearances for installing power supplies. While taking measurements between two fuse blocks mounted on an aluminum plate, he inadvertently touched a fuse clip with the end of the tape. Some portion of the tape contacted the aluminum plate, resulting in the circuit being grounded. The resultant loss of power to critical circuits caused both recirculation pumps to runback to minimum speed. The associated reduction in core flow caused the unit to enter Potential Instability Region I on the power to flow map, which necessitated that the reactor be manually scrammed, as required by Technical Specifications.

The scram resulted in the automatic actuation or isolation of the following Primary Containment Isolation [JE] (PCIS) systems/components.

- PCIS group 2, shutdown cooling mode of Residual Heat Removal [BO] system; Drywell floor drain isolation valve; Drywell equipment drain isolation valve [WP].
- PCIS group 3, reactor water cleanup system [CE].
- PCIS group 6, primary containment purge and ventilation [JM]; Unit 3 reactor zone ventilation [VB]; refuel zone ventilation [VA]; standby gas treatment (SGT) [BH] system; control room emergency ventilation (CREV) [VI] system.
- PCIS group 8, transverse incore probe [IG].

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None

C. Dates and Approximate Times of Major Occurrences:

April 7, 1998 at 1115(CDT)	Operating crew receives alarms which indicate that a breaker on panel 3-9-9 has tripped and that recirculation pump speed limiters are enforcing. They identify that 3A and 3B recirculation pumps are running back to minimum speed.
April 7, 1998 at 1119 (CDT)	Operating crew identifies that Unit 3 has entered Potential Instability Region I on the power to flow map. Unit Operator manually scrams the reactor.
April 7, 1998 at 1212 (CDT)	A one-hour non-emergency report is made to the NRC pursuant to 10 CFR 50.72 (b)(1)(i)(A). A four-hour non-emergency report is made to the NRC pursuant to 10 CFR 50.72 (b)(2)(ii).

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

D. Other Systems or Secondary Functions Affected:

None

E. Method of Discovery:

The operating crew received alarms associated with breaker 603 tripping and the recirculation pumps running back to minimum speed.

F. Operators Actions:

Operators responded to the breaker trip and recirculation pump runback in accordance with alarm response instructions and abnormal operating instructions. After the manual reactor scram, the operators controlled the plant in accordance with abnormal and emergency operating instructions and stabilized the unit in hot shutdown.

G. Safety System Response:

All required safety systems operated as designed.

III. CAUSE OF THE EVENT**A. Immediate Cause:**

The reactor was manually scrammed by the Unit Operator in accordance with abnormal operating instructions after the plant entered Potential Instability Region I on the power to flow map as a result of a runback of both recirculation pumps to minimum speed.

B. Root Cause:

The root cause of the scram was human error. A corporate engineer attempted to measure the height and width of an aluminum plate inside panel 3-9-18 with a metallic measuring tape. While taking measurements, the engineer inadvertently allowed the end of the tape to touch a fuse clip with another portion of the tape in contact with the aluminum plate. This action resulted in the circuit being shorted to ground, tripping breaker 603 on panel 3-9-9.

C. Contributing Factors:

None

IV. ANALYSIS OF THE EVENT

The recirculation pump control circuits responded to the short as expected. The plant response was as designed. Reactor water level decreased to approximately -18 inches and was recovered by the Feedwater Level Control System. This is well above the top of the active fuel. Turbine bypass valves controlled pressure after the scram.

All safety systems operated as expected in response to this event. Operator actions were appropriate and consistent with plant procedures. There were no equipment failures during or following the scram that complicated recovery. As a result, there were no threats to public health and safety.

This report is submitted in accordance with 10 CFR 50.73 (a) (2) (i), as the completion of any nuclear plant shutdown required by the plant's technical specifications and 10 CFR 50.73 (a)(2)(iv) an event that resulted in an automatic actuation of an engineered safety feature, including the reactor protection system.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

The Operations crew manually scrambled the reactor when Potential Instability Region I was entered. The plant was stabilized in hot standby using the appropriate abnormal and emergency operating instructions.

B. Corrective Actions to Prevent Recurrence:

1. Coordinate a revision to NEDP-11, "Design Input Walkdown Controls" to strengthen and more clearly define walkdown and constructibility survey requirements with emphasis on adequate training and knowledge and the control of participation by non-site personnel.¹
2. Brief appropriate Operations and Engineering personnel on NEDP-11, "Design Input Walkdown Controls" after the revision described in item 1 above has been completed.¹
3. Appropriate personnel corrective actions were taken.¹

VI. ADDITIONAL INFORMATION

A. Failed Components:

None

B. Previous Similar Events:

Although there have been previous reports for reactor scrams caused by human error (see below), none of the events resulted from inadvertently shorting a circuit to ground while performing work inside a panel with exposed, energized circuits. Therefore, none of the corrective actions previously taken could have prevented this event.

(50-260/97001) On April 24, 1997, the Unit 2 reactor scrambled due to a turbine trip caused by a high water level trip signal, during the performance of a Core and Containment Cooling Systems Analog Trip Unit Functional Test. The initiating high water level signal was caused by human error when a volt-ohm meter being used in the test was inadvertently connected across terminals of a companion Channel A relay instead of the intended Channel C relay. When logic Channel C was tripped with the meter connected to Channel A, the two-out-of-two trip logic for high water level was completed.

(50-296/96002) On April 21, 1996, the Unit 3 reactor scrambled due to low reactor water level. The event was initiated by the loss of reactor feedwater pump (RFP) 3C while aligning the oil purification system. The feedwater pump trip was caused by human error when an Assistant Unit Operator (AUO) improperly aligned oil valves resulting in draining the RFP 3C oil tank. The discharge check valve on RFP 3C was damaged during the pump trip transient and was not fully seated, allowing back flow from the discharge of the two operating feedwater pumps.

(50-260/95004) On March 30, 1995, the Unit 2 reactor scrambled due to low scram pilot air header pressure, during the performance of a Core and Containment Cooling Systems Analog Trip Unit Functional Test. During this test, alternate rod insertion solenoid valves opened (i.e., energized) and vented control air from the scram pilot air header. The root cause of this event was human error in that an Instrument and Controls technician prematurely repositioned the Anticipated Transient Without Scram mode switch from the 'TEST' to the 'NORMAL' position with a test signal present.

1. These actions are being tracked by TVA's Corrective Action Program and are not considered regulatory commitments.

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B. Previous Similar Events (continued):

(50-260/94004) On April 15, 1994, the Unit 2 reactor scrammed from full power due to low scram pilot air pressure. The root cause of this event was human error in that a senior reactor operator inadvertently isolated both scram pilot air pressure regulating valves. The operator isolated the downstream side of one of the regulating valves in preparation for maintenance without verifying that a header cross-tie valve was open to supply air to the scram pilot air header from the other regulating valve.

VII. COMMITMENTS

None

Energy Industry Identification System (EIIIS) system and component codes are identified in the text with brackets (i.e., [XX]).

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9805140279 DOC.DATE: 98/05/04 NOTARIZED: NO DOCKET #
FACIL:50-296 Browns Ferry Nuclear Power Station, Unit 3, Tennessee 05000296
AUTH.NAME AUTHOR AFFILIATION
CRANE,C.M. Tennessee Valley Authority
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Forwards LER 98-003-00, concerning manual reactor scam from approximately 57 percent power.Rept is submitted per 10CFR50.73(a)(2)(i)(A) & 10CFR50.73(a)(2)(iv).

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 2+5
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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